


CHAPTER 9:
Miscellaneous

CHAPTER 9: MISCELLANEOUS TRANSPORTATION SYSTEM CONSIDERATIONS

9.1 ROADWAY TYPICAL SECTIONS

Roadway typical sections, which generally refers to the geometric features of a given roadway (width, radii, sight distance, etc), impact a transportation system in ways more than just carrying vehicles. Roadways widths and adjacent streetscaping can create a "feel" of a roadway corridor and defined the context of the roadway in a given situation. Historically, in most roadway systems, the standard "mode of operation" to vehicular travel has been to build "bigger and better" facilities. This philosophy has resulted in more lane-miles in expanding existing roadways, the addition of new roadway corridors, as well as a primary focus on transportation system management (i.e. smaller projects to tweak the system). These have all been performed under the guise of moving more cars. Increasingly, though, a trend has emerged of diverting from this and focusing on moving people, improving the quality of the travel environment such that a given roadway is in context with the adjacent land use, and shortening travel distances in an effort to extend available resources and get away from the "bigger is better" philosophy. This trend will be increasingly important in our community's urban areas as desires for context sensitivity are heightened.

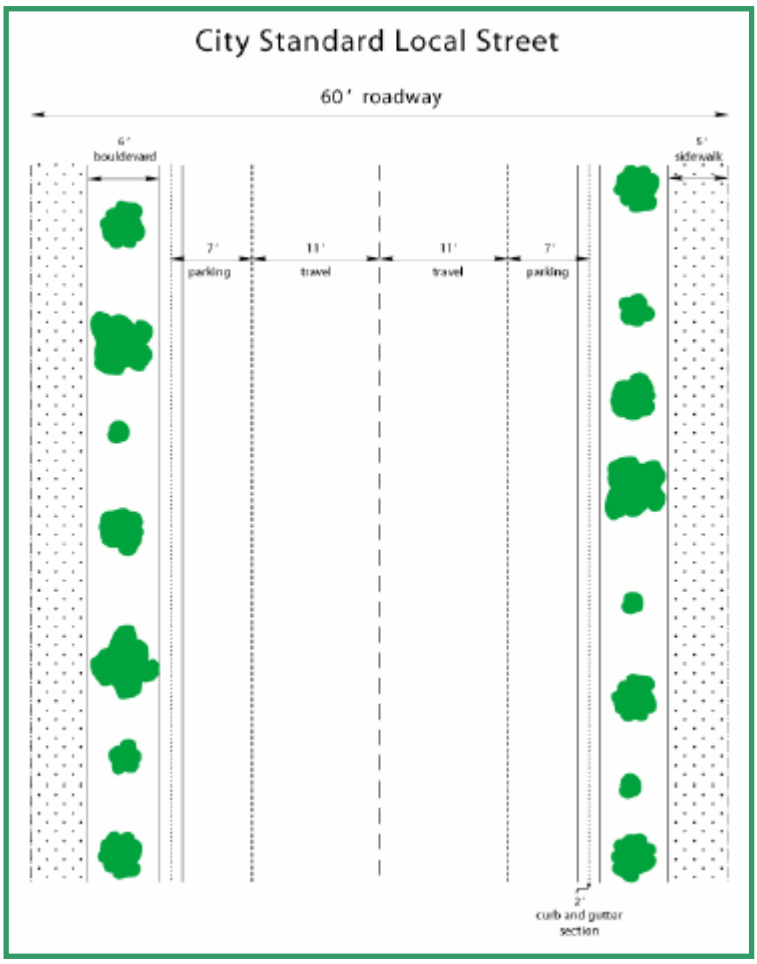
This background is an overriding theme in the City of Whitefish's current Growth Policy Update. The "Transportation Element" discusses "neighborhood sensitive" street standards, and portrays potential context sensitive roadway typical sections for local and residential street sections. It is the intent of this section of the Transportation Plan to point out the opportunities (pros) and constraints (cons) that may ultimately be realized with the use of the alternative street sections.

First and foremost it must be recognized that for most local streets, the local government entity (in this case the City of Whitefish) has direct control over roadway geometry and function, and can therefore dictate roadway typical section appearance. For roadways that are generally collector and above (i.e. minor arterial, principal arterial, interstate), if the facilities are on the Federally adopted "urban aid system" then the roadway geometry is dictated by Montana Department of Transportation (MDT) roadway standards. This is an important point, because the MDT does have "urban design standards" for the various roadway types classified as collectors and above based on dialogue and consensus with many local Montana governments dating back to the early 1990's.

That being said, though, there is a trend to narrower lane widths on many local roadways, and the intent of the current Growth Policy Update is to provide alternatives that may be considered in residential areas as developments are contemplated. These alternative sections, as shown in the current Growth Policy Update, are reiterated herein.

City Standard Local Street (60' Right-of-Way)

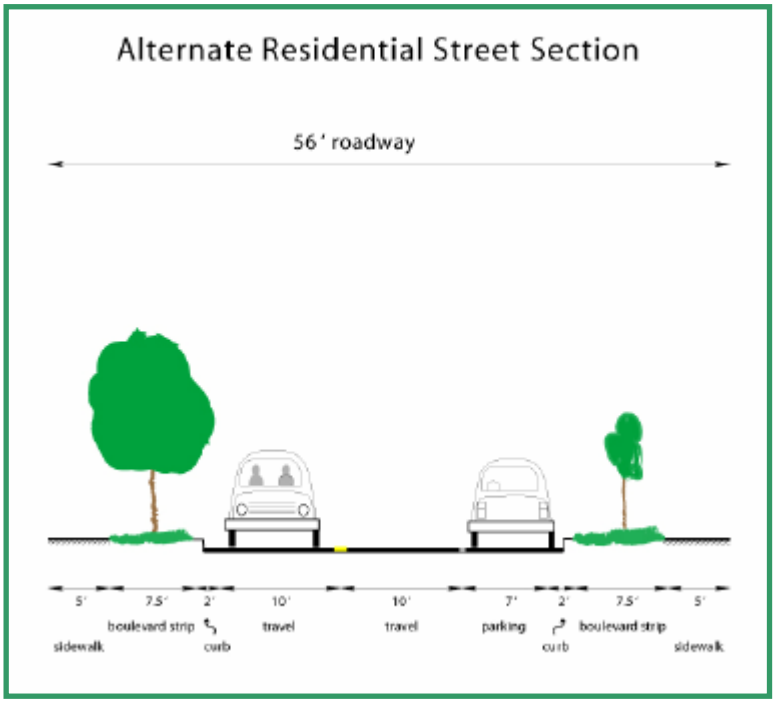
The city standard local street has a 60-foot right-of-way width. Travel lanes are 11-feet in width and accommodates 7-feet of parking on each side. The total pavement width is 34-feet. In addition, there is a 6-foot boulevard with street tress, and a 5 foot sidewalk on each side.



City Standard Local Street (60' Right-of-Way)	
Pro's	**Con's**
Emergency service providers are in favor of the 11-foot travel lanes	Wider travel lane widths can encourage traveling over the acceptable speeds in neighborhoods
On-street parking is provided via 7-foot parking widths	There are no on-street bicycle/pedestrian facilities present
Snow storage is available in the boulevard areas	On-street parking can cause concerns with pedestrians trying to cross the street due to sight visibility
Concrete sidewalks are available for pedestrian safety	

Alternate Residential Street Section (56' Right-of-Way)

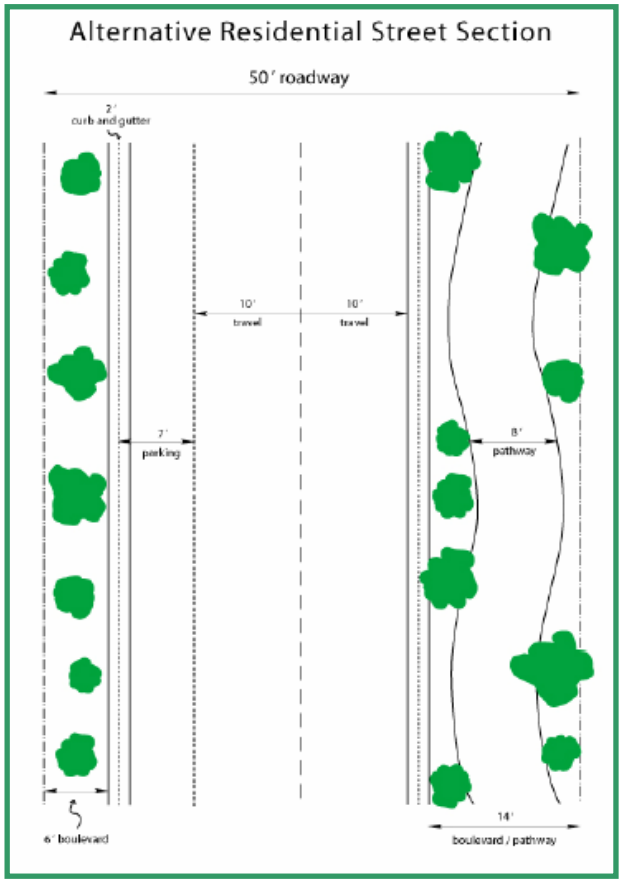
The city alternate residential street section has sidewalks on both sides of the roadway, however parking is eliminated on one side of the street. This is done so the roadside boulevards can be widened to 7.5-feet (instead of 6-feet). Additionally, travel lanes are reduced to 10-feet in width (each direction) to slow speeds. The total right-of-way width for this section is 56 feet.



Alternate Residential Street (56' Right-of-Way)	
Pro's	**Con's**
Ten foot travel lane widths have a tendency to slow vehicle travel speed	Parking is only available on one side of the roadway. May cause blockage in traffic flow when drop-off/pick-up occurs at private residences at "non-parking" side of street.
Pedestrian crossing distances are somewhat reduced with the narrower typical section	There are no on-street bicycle/pedestrian facilities present
Additional snow storage is available due to the wider boulevards	On-street parking can cause concerns with pedestrians trying to cross the street due to sight visibility
Concrete sidewalks are available for pedestrian safety	Ten foot travel lanes are generally the minimum fire service trucks can maneuver

Alternate Residential Street Section (50' Right-of-Way)

This city alternate residential street section only uses 50 feet of right-of-way width. It provides for parking on one side of the street, with a standard boulevard (6-feet width). On the other side of the street, the boulevard is wider to accommodate a meandering 8-foot wide separated bike/pedestrian path.



Alternate Residential Street (50' Right-of-Way)	
Pro's	**Con's**
Ten foot travel lane widths have a tendency to slow vehicle travel speed	Parking is only available on one side of the roadway. May cause blockage in traffic flow when drop-off/pick-up occurs at private residences at "non-parking" side of street.
Pedestrian crossing distances are somewhat reduced with the narrower typical section	There are no on-street bicycle/pedestrian facilities present
Additional snow storage is available due to the boulevards	On-street parking can cause concerns with pedestrians trying to cross the street due to sight visibility
A separated bicycle/pedestrian path exists for increased safety	Ten foot travel lanes are generally the minimum fire service trucks can maneuver

In conclusion, the alternate local street sections have both pros and cons associated with them. There will be numerous cases where narrow roadway sections will be necessary within narrower right-of-way widths. These will chiefly be founded in urban infill areas and existing neighborhoods where existing right-of-way may be an issue. Also, mixed-use design guidelines are increasingly trying to achieve walkability and context sensitivity, and the presented section may in fact achieve the desired end product of creating a more neighborhood friendly design.

A final note must be made, however, regarding the alternate typical sections. For most major roadways in the community (i.e. collectors and above), urban roadway standards do exist through both the Montana Department of Transportation and the City of Whitefish.
It must be made very clear that the alternate roadway sections presented in section 9.1 will not be allowed on those roadways falling under MDT jurisdiction. Again, reference is made to the MDT's "urban design standards" for the various roadway types classified as collectors and above currently in effect. The City does have roadway typical sections on record for different local, collector, and rural streets. These will be the default sections for those roadways not on the "urban aid system", as well as those roadways not requiring higher sensitivity to "context sensitive design" principles. The reader is referenced to the City of Whitefish "Construction Standards" for the default typical sections for the following roadway types:

- Arterial Street (SD-9);
- Collector Street (SD-2);
- Collector Street w/Parking (SD-3);
- Local Street w/out Parking (SD-4);
- Local Street w/Bike Lanes (SD-5);
- Local Street w/Parking (SD-6);
- Local Street w/Bike Path (SD-7); and
- Rural Street (SD-8).

9.2 TRANSIT PARTNERSHIPS WITH EAGLE TRANSIT & GLACIER NATIONAL PARK (GNP)

During the development of this Transportation Plan, dialogue occurred with both Eagle Transit (the Flathead Valley's primary transit provider) and also with Glacier National Park representatives, to discuss ways to heighten awareness of the benefits of transit service e over the planning horizon. There are has been much excitement regarding transit recently due to the unveiling of the transit service as part of the "Going-to-the-Sun" Road Rehabilitation. The transit service was unveiled during the summer of 2007 and is a cooperative agreement between Glacier National Park, the Montana Department of Transportation and Flathead County that allowed for the purchase, operation and maintenance of the transit buses. A goal of these cooperative agreements should be to allow use of transit buses for other parties during the GNP's "off-season".

A fundamental premise of establishing partnerships amongst Glacier National Park, Eagle transit, and the local cities in the Flathead Valley are that there are many, many gateways to the Park and other destinations. The city of Whitefish itself is a primary example. Visitors

flock to the area during both winter and summer months. Providing alternative transportation such that a visitor can arrive in Whitefish, take transit to a lodge in Glacier, view the Park's offerings in transit and by walking, and return home can truly enhance the user experience and serve to shift travel modes. This type of example will take years and years before it could become the "norm". However, community leaders and its citizens should be encouraged to begin planning for this type of interaction and begin establishing partnerships with all the relevant entities/agencies.

Along with the discussion of transit, a discussion of "Intelligent Transportation Systems (ITS)" is relevant. In its simplest form, ITS in Montana has recently manifested itself in the form of certain recognizable features such as the 511 system and traveler kiosks. Making current, up-to-date information available to the traveling public will be by necessity important as the planning horizon continues. Especially given the fact that Glacier National Park is such a world wide destination, enabling and encouraging local communities to forge partnerships with the GNP and make information available is a worthy endeavor.

9.3 PUBLIC TRANSIT CONSIDERATIONS

In addition to the discussion above regarding partnerships with Glacier National Park, other opportunities were identified pertinent to public transportation. These opportunities are as bulleted below:

- Consider future busing opportunities to Big Mountain for special events and/or tourist hiking. Although implementation details would have to be worked out, all believe it is a worthy goal to reduce the number of vehicle trips on the roadway system by developing alternative forms of transportation. Free (and/or subsidized) transit for special events at Big Mountain are one potential measure that should be fully explored as the community grows.

- Consider heightened public transit usage and priority in the community for the Fourth of July festivities. An initial concept pertinent to this discussion is to allow public transit to enter and exit the City Beach area before the private automobile in hopes of encouraging citizens and tourists to use public transit. Again this ties into removing as many private automobiles from the roadway system as possible. Private vehicle parking areas would need to be identified off-site, such that patrons can park their cars and access public transit. Many suggestions have been made (Mountain Village, O'Shaughnessy Center, Safeway, etc.) however additional work would have to be completed before randomly selecting parking lots for public transit transfer pints.

- In spirit with the discussion in **section 9.2** of this chapter, the potential for free (or subsidized) busing to Glacier National Park should be explored in conjunction with perhaps a tourist hiking program. This could be complemented by Whitefish's "Over the Hill Gang" hikes. This represents a long-term opportunity that could also help to reduce private automobiles on the roadway system.

- A major objective of the approved Whitefish Growth Policy is to increase public transit opportunities and to encourage intercity transit usage. This should be fully explored between the City of Whitefish and Eagle Transit. For starters it would be advantageous to try and provide public transit service between Whitefish and Kalispell at least two times a day. This service could connect the Kalispell Medical Center, the Flathead Valley Community College, the Downtown and other points with the City of Whitefish and Big Mountain. Again, this concept is heavily dependent on available funding though Eagle Transit, however the goal is to provide transportation choices and reduce the dependence on the private automobile.

- One concept that was identified through this planning project was the idea of making a bicycle rental program available in the community. This type of program is somewhat common in several places in Europe. The basic concept is that at key locations, locked bicycles are available for usage and can be accessed through a credit card kiosk. When the bicycle is returned, the bicycle is locked and the receipt is distributed. They are generally available at major locations (such as train stations, parking garages, tourist destinations), and could be an alternative transportation feature unique to the community of Whitefish.

- Any future public transit growth and/or capital facility should consider environmentally sound features (such as bio-diesel fuel). In addition, bike racks and covered bike parking should be considered as appropriate.

- Wherever possible, major new land developments should consider transit pull-outs where feasible. This must be tempered with the reality of transit system usage and planned transit routes. However major developments located along important corridors should be fully reviewed to determine if transit pull-outs can be incorporated into the developments frontage.

Lastly, major employment centers should work with Eagle Transit and explore encouragement programs that allow employees to utilize public transit. This mechanism to reduce the dependence on the private automobile will take several years in the making. However as fuel prices rise and public transit becomes more available, the employment community should encourage transit usage through subsidized bus passes, allowance for transit schedule uncertainties, etc.

9.4 URBAN AND SECONDARY HIGHWAY DESIGNATIONS

It is appropriate when completing a regional Transportation Plan to discuss the Urban Highway system designations in place in the community. The formal system in place in the Whitefish area consists of both Urban and Secondary Highways. Because these roads are Montana systems, the Federal government has no direct involvement in the designations.

Urban and Secondary Highways are designated by the Montana Transportation Commission, in cooperation with local governing authorities. When revisions to the system are proposed, the Transportation Commission may require when adding mileage that a reasonably equal amount of mileage be removed. This is not an absolute, and situations do exist where

mileage is added without a corresponding reduction. With that in mind, to meet eligibility requirements for placement on a system of Urban and Secondary Highways, the following criteria must be met:

Secondary Highways
The route must be outside a designated urban area and must be functionally classified as either a rural minor arterial or major collector.

Urban Highways
The route must be within a designated urban area and must be functionally classified as either an urban arterial or collector.

As conditions change in the community, driven by outlying growth and travel characteristic shifts, it is advisable to revisit the urban and secondary highway designations from time to time. To add, or delete, a route from the system, a very specific "six-step" process is in place and must be adhered to. This process is as follows:

1. Requests for new route designations or changes in existing designations are initiated by the local government. Requests must have the support of local elected officials from both the city and county and local transportation committees (if applicable).

2. MDT staff reviews the requests to determine whether the routes meet eligibility requirements.

3. If a route does not meet functional classification eligibility requirements, MDT staff advises the local government about the process and need for a formal review of the routes functional classification and conducts the review.

4. If necessary, MDT staff advises the local government about the Montana Transportation Commission policy that requires no significant net changes in secondary and urban highway mileage within the affected county or urban area as a result of designation changes. Local governments may have to adjust their original request to comply with this requirement.

5. If the proposal meets all eligibility requirements and complies with Transportation Commission policy, MDT staff asks the Transportation Commission to approve the request.

6. If the Transportation Commission approves the request, MDT staff notifies the affected local governments and makes appropriate changes in MDT records.

9.5 CORRIDOR PRESERVATION MEASURES

Corridor preservation is the application of measures to prevent or minimize development within the right-of-way of a planned transportation facility or improvement within a defined corridor. That includes corridors, both existing and future, in which a wide array of transportation improvements may be constructed including roadways, bikeways, multi-use trails, equestrian paths, high occupancy vehicle lanes, fixed-rail lines and more.

Corridor preservation is important because it helps to ensure that a transportation system will effectively and efficiently serve existing and future development within a local community, region or state, and prevent costly and difficult acquisitions after the fact. Corridor preservation policies, programs and practices provide numerous benefits to communities, taxpayers and the public at large. These include, but are not limited to, the following:

- Reducing transportation costs by preservation of future corridors in an undeveloped state. By acquiring or setting aside right-of-way well in advance of construction, the high cost to remove or relocate private homes or businesses is eliminated or reduced.

- Enhancing economic development by minimizing traffic congestion and improving traffic flow, saving time and money. Low cost, efficient transportation helps businesses contain final costs to customers and makes them more competitive in the marketplace. Freight costs, for instance, accounts for ten percent of the value of agricultural products, the highest for any industry.

- Increasing information sharing so landowners, developers, engineers, utility providers, and planners understand the future needs for developing corridors. An effective corridor preservation program ensures that all involved parties understand the future needs within a corridor and that state, local and private plans are coordinated.

- Preserving arterial capacity and right-of-way in growing corridors. Corridor preservation includes the use of access management techniques to preserve the existing capacity of corridors. When it is necessary, arterial capacity can be added before it becomes cost prohibited by preserving right-of-way along growing transportation corridors.

- Minimizing disruption of private utilities and public works. Corridor preservation planning allows utilities and public works providers to know future plans for their transportation corridor and make their decisions accordingly.

- Promoting urban and rural development compatible with local plans and regulations. The state and local agencies must work closely together to coordinate their efforts. Effective corridor preservation will result in development along a transportation corridor that is consistent with local policies.

To effectively achieve the policies and goals listed above, corridor management techniques can be utilized. These techniques can involve the systematic application of actions that:

- Preserve the safety and efficiency of transportation facilities through **access management**; and,

- Ensure that new development along planned transportation corridors is located and designed to accommodate future transportation facilities (**corridor preservation measures**).

Access Management

Access management techniques are increasingly fundamental to preserving the safety and efficiency of a transportation facility. Access control can extend the carrying capacity of a roadway, reducing potential conflicts and facilitating appropriate land usage. There are six basic principles of access management that are used to achieve the desired outcome of safer and efficient roadways. These principles are:

- Limit the number of conflict points.
- Separate the different conflict points.
- Separate turning volumes from through movements.
- Locate traffic signals to facilitate traffic movement.
- Maintain a hierarchy of roadways by function.
- Limit direct access on higher speed roads.

It is recommended that local government adopt a set of Access Management Regulations through which the need for access management principles can be evaluated on a case-by-case basis. For roadways on the State system and under the jurisdiction of the Montana Department of Transportation (MDT), access control guidelines are available which define minimum access point spacing, access geometrics, etc., for different roadway facilities. For other roadways (non-State), the adoption of an access classification system based upon the functional classification of the roadway (principal arterial, minor arterial or major collector) is desirable. These local regulations should serve to govern minimum spacing of drive approaches/connections and median openings along a given roadway in an effort to fit the given roadway into the context of the adjacent land uses and the roadway purpose. The preparation and adoption of a local Access Management Ordinance should be pursued that can adequately document the local government's desire for standard approach spacing, widths, slopes and type for a given roadway classification. Different types of treatment that can assist in access control techniques are:

- Non-traversable raised medians
- Frontage roads
- Consolidation and/or closure of existing accesses to the roadway
- Directional raised medians
- Left-turn bay islands
- Redefinition of previously uncontrolled access
- Raised channelization islands to discourage turns
- Regulate number of driveways per property

Corridor Preservation Measures

Another tool used to fulfill the policies and goals listed earlier in this chapter is that of specific corridor preservation measures. As was stated above regarding developing a local Access Management Ordinance, it is desirable to develop a Corridor Preservation Ordinance as well. Such an ordinance would serve to accomplish the following:

- Establish criteria for new corridor preservation policies to protect future transportation corridors from development encroachment by structures, parking areas, or drainage facilities (except as may be allowed on an interim basis). Some possible criteria could include the on-site transfer of development rights and the clustering of structures;

- Establish criteria for providing right-of-way dedication and acquisition while mitigating adverse impacts on affected property owners; and

- Establish criteria by which land dedication requirements can be identified and set forth as roughly proportionate to the transportation impacts generated by a proposed project.

9.6 TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) measures came into being during the 1970s and 1980s in response to a desire to save energy, improve air quality, and reduce peak-period congestion. TDM strategies focused on identifying alternates to single occupant vehicle use during commuting hours. Therefore, such things as carpooling, vanpooling, transit use, walking and bicycling for work purposes are most often associated with TDM. Many of these methods were not well received by the commuting public and therefore, provided limited improvement to the peak-period congestion problem. Due to the experiences with these traditional TDM measures over the past few decades, it became clear that the whole TDM concept needed to be changed. TDM measures that have been well received by the commuting public include flextime, a compressed workweek and telecommuting. In addition to addressing commute trip issues, managing demand on the transportation system includes addressing traffic congestion associated with special events, such as special activities at the Big Mountain Resort, and special downtown events. A definition of TDM follows:

> *TDM programs are designed to maximize the people-moving capability of the transportation system by increasing the number of persons in a vehicle, or by influencing the time of, or need to, travel. (FHWA, 1994)*

Since 1994, TDM has been expanded to also include route choice. A parallel arterial with excess capacity near a congested arterial can be used to manage the transportation system to decrease congestion for all transportation users.

The Whitefish area is projected to grow. The accompanying expansion of transportation infrastructure is expensive and usually lags behind growth. Proper management of demand now will maximize the existing infrastructure and delay the need to build more expensive

additional infrastructure. TDM is an important and useful tool to extend the useful life of a Transportation System.

As communities such as Whitefish grow, the growth in number of vehicles and travel demand should be accommodated by a combination of road improvements; transit service improvements; bicycle and pedestrian improvements; and a program to reduce travel (vehicle trips and the vehicle miles traveled) via transportation demand management in conjunction with appropriate land use planning.

TDM strategies should be considered an important part of the Whitefish Transportation Plan due to their inherent ability to provide better predictability and choice to the user. TDM measures can also be applied to non-commuter traffic and are especially easy to adapt to tourism, special events, emergencies and construction.

Overall, congestion can be avoided or managed on a long-term basis through the use of an integrated system of TDM strategies.

LIST OF TDM STRATEGIES AND THEIR EFFECTIVENESS

The following list of TDM strategies are measures that may be beneficial in the Whitefish community over the planning horizon. Many of these have been used by other communities in the United States and include:

- **Bicycling** - Bicycling can substitute directly for automobile trips. Communities that improve cycling conditions often experience significant increases in bicycle travel and related reductions in vehicle travel. Incentives to increase bicycle usage as a TDM strategy include: construction improvements to bike paths and bike lanes; correcting specific roadway hazards (potholes, cracks, narrow lanes, etc.); development of a more connected bikeway street network; development of safety education, law enforcement and encouragement programs; and the solicitation and addressing of bicycling security/safety concerns. Potential costs of this TDM strategy are expenses associated with creating and maintaining the bikeway network, potential liability and accident risks (in some cases), and increased stress to drivers.

- **Walking** - Walking as a TDM strategy has the ability to substitute directly for automobile trips. A relatively short non-motorized trip often substitutes for a longer car trip. For example, a shopper might choose between walking to a small local store versus driving a longer distance to shop at a supermarket. Incentives to encourage walking in a community can include: making improvements to sidewalks, crosswalks and paths by designing transportation systems that accommodate special needs (including people using wheelchairs, walkers, strollers and hand carts); providing covered walkways, loading and waiting areas; improving pedestrian accessibility by creating location-efficient, clustered, mixed land use patterns; and soliciting and addressing pedestrian security/safety concerns. Costs are similar to that of bicycling and are generally associated with program expenses and facility improvements.

- **Ride sharing (carpooling)** - Carpooling is traditionally one of the most widely considered TDM strategies. The idea is to consolidate drivers of single occupancy vehicles (SOV's) into fewer vehicles, with the result being a reduction in congestion. Carpooling is generally limited to those persons whose schedules are rigid and not flexible in nature. Studies have shown that carpooling is most effective for longer trips greater than ten miles in each direction. Aside for the initial administrative cost of set-up and marketing, ridesharing also may encourage urban sprawl by making longer-distance commutes more affordable.

  Transit agencies sometimes consider rideshare as competition that reduces transit ridership. Ridesharing is a strategy that would work within the Whitefish area, especially if set up through the larger employers. An extensive public awareness campaign describing the benefits of this program would help in selling it to the general public.

- **Vanpooling** - Vanpooling is a strategy that encourages employees to utilize a larger vehicle than the traditional standard automobile to arrive at work. Vans typically hold twelve or more persons. Vanpooling generally does not require high levels of subsidy usually associated with a fixed-route or demand-responsive transit service. They can often times be designed to be self-sufficient. The van is typically provided by the employer, or a vanpool brokerage agency, which provides the insurance. The costs of a vanpooling program are very similar to those of ridesharing.

- **Park & Ride lots** - Park and ride lots are effective for communities with substantial suburb to downtown commute patterns. Park and ride consists of parking facilities at transit stations, bus stops and highway on ramps, particularly at the urban fringe, to facilitate transit and rideshare use. Parking is generally free or significantly less expensive than in urban centers. Costs are primarily associated with facility construction and operation.

- **Traditional transit** - Traditional transit service is an effective TDM strategy, especially in a highly urban environment. Several methods to increase transit usage within the community are to improve overall transit service (including more service, faster service and more comfortable service), reduce fares and offer discounts (such as lower rates for off-peak travel times, or for certain groups), and improved rider information and marketing programs. The costs of providing transit depend on many factors, including the type of transit service, traffic conditions and ridership. Transit service is generally subsidized, but these subsidies decline with increased ridership because transit services tend to experience economies of scale (a 10% increase in capacity generally increases costs by less than 10%). TDM strategies that encourage increased ridership can be very cost effective. These strategies may include offering bicycle carrying components on the transit vehicle, changing schedules to complement adjacent industries, etc.

- **Traffic Calming** - Traffic Calming (also called Traffic Management) refers to various design features and strategies intended to reduce vehicle traffic speeds and volumes on a particular roadway. Traffic Calming projects can range from minor modifications of an individual street to comprehensive redesign of a road network.

Traffic Calming can be an effective TDM strategy in that its use can alter and/or deter driver characteristics by forcing the driver to either use a different route or to use an alternative type of transportation (such as transit, bicycling, walking, etc.). Costs of this TDM strategy include construction expenses, problems for emergency and service vehicles, potential increase in drivers' effort and frustration, and potential problems for bicyclists and visually impaired pedestrians.

- **Flextime** - When provided by employers, flextime allows workers to adjust their commuting time away from the peak periods. This means that employees are allowed some flexibility in their daily work schedules. For example, rather than all employees working 8:00 to 4:30, some might work 7:30 to 4:00, and others 9:00 to 5:30. This provides the workers with a less stressful commute, allows flexibility for family activities and lowers the number of vehicles using the transportation system during peak times. This in turn can translate into reduced traffic congestion, support for ridesharing and public transit use, and benefits to employees. Flextime allows commuters to match their work schedules with transit and rideshare schedules, which can significantly increase the feasibility of using these modes. Costs for implementing this type of TDM strategy can include increased administrative and management responsibilities for the employer, and more difficulty in evaluating an employee's productivity.

- **Alternate work schedule** - A related but more expansive strategy is to provide an alternate work schedule. This strategy involves using alternate work hours for all employees. It would entail having the beginning of the normal workday start at a time other than 8:00 a.m. For example, starting the workday at 7:30 a.m. would allow all employees to reach the work site in advance of the peak commute time. Additionally, since they will be leaving work at 4:30 p.m., they will be home before the peak commute time, and have more time in the evening to participate in family or community activities. This can be a very desirable side benefit for the employees. This has a similar effect on traffic as flextime, but does not give individual employees as much control over their schedules.

- **Compressed work week** - A compressed work week is different from offering "flextime" or the "alternate work schedule" in that the work week is actually reduced from the standard "five-days-a-week" work schedule. A good example would be employers giving their workers the opportunity to work four (4) ten-hour days a week. A compressed work week reduces commute travel (although this reduction may be modest if employees take additional car trips during non-work days or move farther from worksites). Costs for implementing this type of TDM strategy may be a reduction in productivity (employees become less productive at the end of a long day), a reduction in total hours worked, and it may be perceived as wasteful by the public (for example, if staffing at public agencies is low on Fridays).

- **Identifying and using special routes and detours for emergencies or special events** - This type of TDM strategy centers around modifications to driver patterns during special events or emergencies. They can typically be completed with intensive temporary signing or traffic control personnel. Temporary traffic control via signs and flaggers could be implemented to provide a swift and safe exit after applicable events.

- **Preferential parking for rideshare/carpool/vanpools** - This concept ties into the discussion above regarding parking of the SOV user. Preferential parking, such as delineating spaces closer to an office for riders sharing their commute or reduced/free parking, can be an effective TDM strategy.

- **Telecommuting** - Telecommuting in the work place offers a good chance to reduce the dependence to travel to work via car or bus. This is especially true in technical positions and some fields in the medical industry (such as medical transcription). Additionally, opportunities for distance learning, shopping via computers, basic health care services and recreation also exist and can serve to reduce vehicular travel on the transportation system. Telecommuting is usually implemented in response to an employee request, more so than instigated by the employer. Since telecommuting reduces commute trips, it can significantly reduce congestion and parking costs. It is highly valued by many employees and tends to increase their productivity and job satisfaction. Costs associated with this TDM strategy include increased administrative and management responsibilities, and more difficult evaluation of employee productivity. Some employees find telecommuting difficult and isolating. Telecommuting also may reduce staff coverage and interaction, and make meetings difficult to schedule. Many employers in Montana have tried and currently allow some form of telecommuting.

- **Subsidized transit by employers** - A subsidized transit program, typically offered by employers to their employees, consists of the employer either reimbursing or paying for transit services in full as a benefit to the employee. This usually comes in the form of a monthly or annual transit pass. Studies show that once a pass is received by an employee, the tendency to use the system rises dramatically.

- **Required densification / mixed use elements for new developments** - Requiring new developments to be dense and contain mixed-use elements will ensure that these developments are urban in character and have some services that can be reached by biking, walking or using other non-automobile methods. This also relates to the concept of "linked" or "shared" trips presented later in this chapter. As new developments are proposed, local and regional planners have the opportunity to dictate responsible and effective land use to encourage "shared" trips and reduce impacts to the surrounding transportation system.

- **Transit Oriented Development (TOD)** - Transit Oriented Development (TOD) refers to residential and commercial areas designed to maximize access by transit and non-motorized transportation, and with other features to encourage transit ridership. A TOD usually consists of a neighborhood with a rail or bus station, surrounded by relatively high-density development, with progressively lower-density spreading outwards. Transit Oriented Development generally requires about seven residential units per acre in residential areas and twenty-five employees per acre in commercial centers to adequately justify transit ridership. Transit ridership is also affected by factors such as employment density and clustering, demographic mix (students, seniors and lower-income people tend to be heavy transit users), transit pricing and rider subsidies, and the quality of transit service. This type of development could potentially work well within Whitefish and its outlying areas as development occurs.

By capitalizing on the use of these options, the existing vehicular infrastructure can be made to function at acceptable levels of service for a longer period of time. Ultimately, this will result in lower per year costs for infrastructure replacement and expansion projects, not to mention less disruption to the users of the transportation system. The Montana Department of Transportation is developing a Montana specific "TDM Toolbox". In evaluating local options for TDM it is suggested to look for programs and alternatives that have been successfully implemented in Montana.

9.7 PAVEMENT PRESERVATION STRATEGIES

Pavement preservation represents a proactive approach in maintaining existing community roads. It enables communities to reduce costly, time consuming rehabilitation and reconstruction projects and the associated traffic disruptions. With timely preservation the traveling public can be provided improved safety and mobility, reduced congestion, and smoother, longer lasting pavements. This is the true goal of pavement preservation. A Pavement Preservation Program consists primarily of three components:

- Preventive maintenance;
- Minor rehabilitation (non structural); and
- Routine maintenance activities

An effective pavement preservation program can benefit communities by preserving investment on their roadways, enhancing pavement performance, ensuring cost effectiveness, extending pavement life, reducing user delays, and providing improved safety and mobility. Pavement preservation is a combination of different strategies which, when taken together, achieve a single goal. It is useful to clarify the distinctions between the various types of maintenance activities, especially in the sense of why they would or would not be considered preservation. For a treatment to be considered pavement preservation, one must consider its intended purpose. The distinctive characteristics of pavement preservation activities are that they restore the function of the existing system and extend its service life, not increase its capacity or strength.

Definitions for Pavement Preservation Programs
(from US Department of Transportation memorandum HLAM-20)

Pavement Preservation is "…a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations." (*Source: FHWA Pavement Preservation Expert Task Group*)

An effective pavement preservation program will address pavements while they are still in good condition and before the onset of serious damage. By applying a cost-effective treatment at the right time, the pavement is restored almost to its original condition. The cumulative effect of systematic, successive preservation treatments is to postpone costly rehabilitation and reconstruction. During the life of a pavement, the cumulative discount value of the series of pavement preservation treatments is substantially less than the discounted value of the more extensive, higher cost of reconstruction and generally more economical than the cost of major rehabilitation. Additionally, performing a series of successive pavement preservation treatments during the life of a pavement is less disruptive to uniform traffic flow than the long closures normally associated with reconstruction projects.

Preventive Maintenance is "a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without significantly increasing the structural capacity)." (*Source: AASHTO Standing Committee on Highways, 1997*)

Preventive maintenance is typically applied to pavements in good condition having significant remaining service life. As a major component of pavement preservation, preventive maintenance is a strategy of extending the service life by applying cost-effective treatments to the surface or near-surface of structurally sound pavements. Examples of preventive treatments include asphalt crack sealing, chip sealing, slurry or micro-surfacing, thin and ultra-thin hot-mix asphalt overlay, concrete joint sealing, diamond grinding, dowel-bar retrofit, and isolated, partial and/or full depth concrete repairs to restore functionality of the slab; e.g., edge spalls, or corner breaks.

Pavement Rehabilitation consists of "structural enhancements that extend the service life of an existing pavement and/or improve its load carrying capacity. Rehabilitation techniques include restoration treatments and structural overlays." (*Source: AASHTO Highway Subcommittee on Maintenance*)

Rehabilitation projects extend the life of existing pavement structures either by restoring existing structural capacity through the elimination of age-related, environmental cracking of embrittled pavement surface or by increasing pavement thickness to strengthen existing pavement sections to accommodate existing or projected traffic loading conditions. Two sub-categories result from these distinctions, which are directly related to the restoration or increase of structural capacity.

Minor rehabilitation consists of non-structural enhancements made to the existing pavement sections to eliminate age-related, top-down surface cracking that develop in flexible pavements due to environmental exposure. Because of the non-structural nature of minor rehabilitation techniques, these types of rehabilitation techniques are placed in the category of pavement preservation.

Major rehabilitation "…consists of structural enhancements that both extend the service life of an existing pavement and/or improve its load-carrying capability." (*Source: AASHTO Highway Subcommittee on Maintenance Definition*)

Routine Maintenance "consists of work that is planned and performed on a routine basis to maintain and preserve the condition of the highway system or to respond to specific conditions and events that restore the highway system to an adequate level of service." (*Source: AASHTO Highway Subcommittee on Maintenance*)

Routine maintenance consists of day-to-day activities that are scheduled by maintenance personnel to maintain and preserve the condition of the highway system at a satisfactory level of service. Examples of pavement-related routine maintenance activities include cleaning of roadside ditches and structures, maintenance of pavement markings and crack filling, pothole patching and isolated overlays. Crack filling is another routine maintenance activity which consists of placing a generally, bituminous material into "non-working" cracks to substantially reduce water infiltration and reinforce adjacent top-down cracks. Depending on the timing of application, the nature of the distress, and the type of activity, certain routine maintenance activities may be classified as preservation. Routine Maintenance activities are often "in-house" or agency-performed and are not normally eligible for Federal-aid funding.

Other activities in pavement repair are an important aspect of any construction and maintenance program, although they are outside the realm of pavement preservation:

Corrective Maintenance activities are performed in response to the development of a deficiency or deficiencies that negatively impact the safe, efficient operations of the facility and future integrity of the pavement section. Corrective maintenance activities are generally reactive, not proactive, and performed to restore a pavement to an acceptable level of service due to unforeseen conditions. Activities such as pothole repair, patching of localized pavement deterioration, e.g. edge failures and/or grade separations along the shoulders, are considered examples of corrective maintenance of flexible pavements. Examples for rigid pavements might consist of joint replacement or full width and depth slab replacement at isolated locations.

Catastrophic Maintenance describes work activities generally necessary to return a roadway facility back to a minimum level of service while a permanent restoration is being designed and scheduled. Examples of situations requiring catastrophic pavement maintenance activities include concrete pavement blow-ups, road washouts, avalanches, or rockslides.

Pavement Reconstruction is the replacement of the entire existing pavement structure by the placement of the equivalent or increased pavement structure.

Reconstruction usually requires the complete removal and replacement of the existing pavement structure. Reconstruction may utilize either new or recycled materials incorporated into the materials used for the reconstruction of the complete pavement section. Reconstruction is required when a pavement has either failed or has become functionally obsolete.

9.8 US HIGHWAY 93 BYPASS DISCUSSION

This Transportation Plan does not recommend the development of a bypass corridor to the existing US Highway 93 facility through the community. The concept of a bypass has historically been debated. Proponents of the bypass have stated that it will reduce overall traffic volumes in the downtown, detour high truck traffic and make the business district more "community oriented". Opponents of the bypass have stated that a bypass would never be built, would likely cause unacceptable environmental consequences and would be financially unattainable.

This Transportation Plan did examine a potential westerly bypass via a travel demand modeling exercise, and also has looked at other constraints associated with potential routes. These have been explained in **chapter 3** of this Transportation Plan. From a pure traffic analysis discussion, a bypass does not solve the future traffic issues examined out to the planning horizon (year 2030) along US Highway 93. Although proponents find this hard to believe, the fact is that if a bypass is to be considered as feasible, it must show significant traffic reduction to its parallel facility to warrant the expense and environmental consequences of its development. Travel demand modeling of the various bypass alternatives do not show a bypass as a "cure-all" to the future traffic issues associated with US Highway 93 traffic flow.

Because of this, any recommendation to carry the bypass concept forward will not be implementable, feasible and/or fundable in the public venue, nor will State and Federal jurisdictions program resources accordingly. The community of Whitefish is better served by strengthening the transportation grid system, providing additional east/west connectivity, and requiring roadway corridor development in vacant land **if and when** the land develops. The recommended projects contained in **chapter 8** will all serve to contribute to a strong grid street system that will provide choices for the traveling public. This should be tempered with other transportation system improvements and policies, such as public transit and non-motorized facilities, that have been recommended elsewhere in this Transportation Plan.

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